

Claims

1. A differential pan removably attachable to a vehicle to cover the differential unit of the vehicle and a locking device able to be fitted to the differential unit of the vehicle
5 in which, when the differential pan is attached to the vehicle, the locking device is able to be attached to the vehicle differential unit inside the differential pan.
2. A differential pan as claimed in claim 1 in which the locking device includes a mechanical actuator which acts on the locking device to operate the locking device.
10
3. A differential pan as claimed in claim 2 in which actuator is a solenoid.
4. A differential pan as claimed in claim 2 or 3 in which the actuator is adapted to be mounted on the axle casing, within the differential pan area.
15
5. A differential pan as claimed in claim 2 or 3 in which the actuator is adapted to be mounted onto a differential pan mounting ring.
6. A differential pan as claimed in one of the preceding claims in which the locking
20 device comprises a fork which is able to communicate reciprocal movement which engages/disengages a sliding dog gear, splined to the half shaft of the vehicle, into a splined bearing journal located in the differential carrier.
7. A differential pan as claimed in any one of the preceding claims in which there is a
25 ring or ring with an additional protrusion which can be fitted to the axle assembly to act as a mounting stage for an extended differential pan.
8. A differential pan as claimed in one of the preceding claims in which, when installed on a vehicle does not foul any of the vehicles services, such as brake lines, exhaust
30 pipes or suspension components etc. due to its positioning within differential pan.

- 7 -

9. A differential pan as claimed in one of the preceding claims which is constructed from an acrylonitrile/butadiene/styrene (ABS) plastics material
- 5 10. A vehicle having an axle incorporating a differential unit in which there is a differential locking pan and locking device as claimed in any one of the preceding claims.
- 10 11. A vehicle as claimed in claim 10 in which when there is a removable type of differential pan, there is provision for an extended area to accommodate the differential locking unit.
- 15 12. A vehicle as claimed in claim 10 or 11 in which there is a steel ring or ring with an additional protrusion, which is fitted to the axle assembly, which acts as a mounting stage for an extended differential pan.
- 20 13. A vehicle as claimed in any one of claims 10 to 12 in which there is a press-in bearing journal fitted into the differential carrier core, which incorporates a splined locking portion and also acts as a bearing journal for the sun gear of the differential unit.
- 25 14. A vehicle as claimed in any one of claims 10 to 13 in which the differential pan or locking device does not foul any of the vehicles services, such as brake lines, exhaust pipes or suspension components etc.
15. A vehicle as claimed in any one of claims 10 to 14 in which there is a manual override for the locking device.
- 30 16. A vehicle as in any one of claims 10 to 15 in which the actuator is mounted onto the differential unit bearing cap.

- 8 -

17. A vehicle as claimed in any one of claims 10 to 15 in which the actuator is mounted onto the axle casing, within the differential pan area.

5 18. A vehicle as claimed in any one of claims 10 to 15 in which the actuator is mounted onto the differential pan mounting ring.

19. A vehicle as claimed in any one of claims 10 to 18 in which the differential pan is removable to set up, inspect and/or adjust the differential lock assembly.

10

20. A vehicle as claimed in any one of claims 10 to 19 in which the axle casing material is reduced under differential pan to allow for locking component movement.

15 21. A vehicle as claimed in any one of claims 10 to 20 in which a differential pan mounting ring is used as reinforcement to the axle assembly.

22. A vehicle as claimed in any one of claims 10 to 19 in which there is a removable differential guard mounted onto the differential pan mounting ring bolts.

20 23. A vehicle as claimed in any one of claims 10 to 19 in which there are mounting studs used to create a space between mounting ring and axle assembly suitable for welding.

25 24. A vehicle as claimed in any one of claims 10 to 23 where reciprocal movement caused by an actuator positioned under a removably attachable cover is employed to warn the operator of the operational status of the actuator.

25. A vehicle as claimed in any one of claims 10 to 24 where a switch mounting plate combined with a bearing adjuster locking tab is employed.

30

- 9 -

26. A vehicle as claimed in any one of claims 10 to 25 where a switching device is mounted inside the shaped ring to communicate operational status or position of the actuator.

- 5 27. A method for fitting a differential pan as claimed in any one of claims 1 to 9 to a vehicle which comprises fixing a mounting ring onto the rear of the axle assembly of the vehicle, in place of the conventional differential pan, fitting the removable differential cover to the mounting ring to encase the entire assembly.
- 10 28. A method as claimed in claim 27 in which the mounting ring is attached to the rear of the axle assembly by welding.
- 15 29. A method as claimed in claim 27 or 28 in which a mechanical actuator device is mounted inside the shaped ring, parallel to the half shaft to operate the locking device which actuator is connected to a fork, which in turn communicates reciprocal movement which engages/disengages a sliding dog gear, splined to the half shaft, into a splined bearing journal located in the differential carrier.
- 20 30. A method as claimed in claim 29 in which the actuator is a solenoid.
31. A method as claimed in any one of claims 27 to 30 in which there are mounting studs used to create a space between mounting ring and axle assembly suitable for welding.